Diesel On-Road Private Fleets Control Measure Public Workshop

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Jackie Johnson
In-Use Control Measures Section
Heavy-Duty Diesel In Use Strategies Branch

California Environmental Protection Agency
Air Resources Board

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Overview

- Diesel Risk Reduction Program
- ARB Diesel PM Control Measures (Adopted and Future)
- Diesel PM Emission Reduction Strategies
- On-Road Private Fleets
- Next Steps

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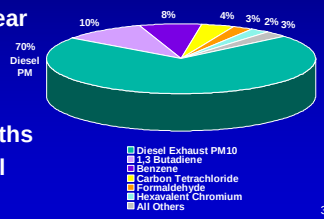
Health Effects of Diesel PM in California

- Increases cancer risk, hospital admissions & premature deaths
- In California in year 2000, diesel PM responsible for:
  - 2000-2500 premature deaths
  - ~3,600 hospital admissions
- 70% of known statewide air toxics risk is from diesel PM



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California Diesel Risk Reduction Plan

- Established Goals
  - Reduce PM emissions from all diesel-fueled engines in California
  - 75% reduction by 2010
  - 85% reduction by 2020
- Four-pronged approach
  - New engine standards
  - Cleaner diesel fuel - <15 ppm S
  - Retrofit of existing engines
  - Ensure in-use emissions maintained

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ARB Diesel PM Control Measures

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Adopted ARB Diesel PM Measures

- Transit agency fleet rule (2000)
- School bus idling (2002)
- Solid waste collection vehicles (2003)
- Stationary compression ignition engines (2004)
- Portable engines (2004)
- Transport refrigeration units (2004)
- Commercial vehicle idling (2004)

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Adopted ARB Diesel PM Measures *(continued)*

- Locomotives/harborcraft fuel (2004)
- Transit fleet vehicles (2005)
- Public agency/utility on-road fleets (2005)
- Port/rail cargo handling equipment (2005)
- Ship auxiliary engine fuel (2005)

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Future ARB Diesel Measures

- 2006/07
  - Off-Road Mobile Equipment
  - On-Road Private Fleets
  - Harbor Craft
  - Stationary Agricultural Engines
  - Off-Road Agricultural Engines

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Diesel PM Emission Reduction Strategies

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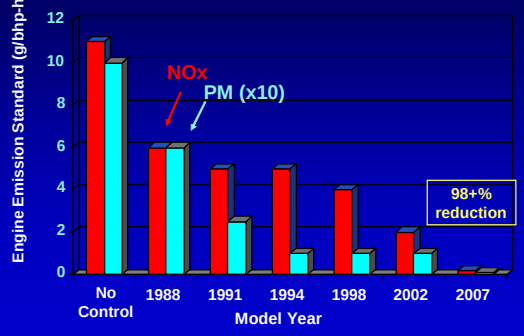
New Engines for Heavy-Duty Diesel Trucks Much Cleaner



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Cleaner Diesel Fuels

- ARB requires 15 ppm sulfur diesel fuel for on-road engines, off-road equipment, and stationary engines effective mid 2006
  - California diesel fuel continues to limit aromatics content to reduce NOx
- National on-road EPA low sulfur diesel being phased-in in late 2006

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Reducing Emissions from Existing Engines

- In-use controls - ensure engines operate as cleanly as possible
- Fleet rules - modernize fleets through accelerated replacement, repower, and retrofit

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In-Use Controls for Heavy-Duty Vehicles

- *Maintaining emission levels in-use:*
  - Roadside Smoke Inspection Program
  - Software upgrade (chip reflash)
  - On-board diagnostic program
    - Applies to 2010 model year vehicles
  - In-use compliance test program
- *Operational controls:*
  - Idling limits (adopted 2004)

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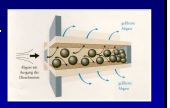
PM Reduction From Existing Vehicles

Control Strategy	PM Reduction
Exhaust Filter	85%
Exhaust Catalysts	25%
Re-power with newer engine	20% to 90%
New vehicle	90%
Other (typical)	10% to 50%

- Engine modifications
- Fuel additives
- Alternative diesel fuel derivatives



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Compliance Flexibility

- Additional time to repower engine if verified retrofit controls are not available
- Special provisions for smaller fleets
- Special provisions for very low usage fleets
- Early compliance credit

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Diesel Retrofit Emission Control Technologies

Exhaust Gas Aftertreatment

- Diesel Oxidation Catalyst
- Diesel Particulate Filter – Passive
- Diesel Particulate Filter - Active
- Lean NOx Catalyst
- Selective Catalytic Reduction
- NOx Adsorbers
- Flow-Through Filters
- Exhaust Gas Recirculation

Fuel Based Technologies

- Alternative Diesel Fuels - Emulsions
- Alternative Diesel Fuels - Biodiesel
- Alternative Diesel Fuels - Gas to Liquids
- Fuel Additives

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Verified PM Retrofit Technologies

- **ARB verifies effectiveness of emissions control technology**
- **Currently 25 PM diesel emission control systems verified**
  - **Level 1 (25% reduction) - 9 systems**
  - **Level 2 (50% reduction) - 4 systems**
  - **Level 3 (>85% reduction) - 12 systems**
- **Memorandum of Agreement with U.S. EPA for emission testing and verification levels**

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Carl Moyer and Other Incentive Programs

- **Grants to fund incremental cost to install cleaner engines or retrofit devices early**
  - **For early or extra emission reductions**
- **$154 million spent over 6 years**
  - **7000 engines cleaned up; 136 trucks (first 4 years)**
  - **Cost effective - $3000/ton NOx**
- **New on-going funding beginning 2005**
  - **$140 million/year**
  - **PM retrofits and fleet modernization now eligible**
- **Other Incentive Programs (Gateway Cities and SECAT)**
  - **650 trucks funded**

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Heavy-Duty Diesel Private Fleets

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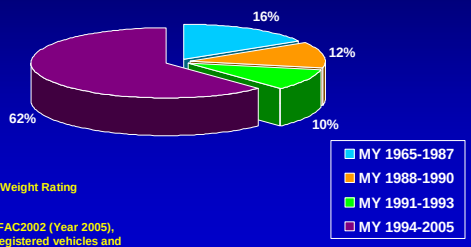
Heavy-Duty Diesel Private Fleets 2005 Vehicle Age Distribution (Vehicles > 14,000 lbs*) (Total Population ~ 270,000**)



*Gross Vehicle Weight Rating

**Based on EMFAC2002 (Year 2005), Excludes non-registered vehicles and vehicles covered under the public fleets, transit, urban bus, and trash truck rules.

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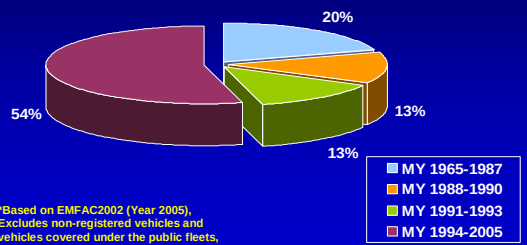
Heavy-Duty Diesel Private Fleets 2005 Diesel PM Emissions (Vehicles > 14,000 lbs) (Total Diesel PM Emissions ~ 9 tons per day*)



*Based on EMFAC2002 (Year 2005), Excludes non-registered vehicles and vehicles covered under the public fleets, transit, urban bus, and trash truck rules.

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On-Road Private Fleets
Business Type

Business Type	Percent of Fleet
For Hire Transportation or Warehousing	38%
Construction	14%
Wholesale Trade	10%
Agriculture, Forestry, Fishing, or Hunting	9%
Vehicle Leasing or Rental	8%
Waste Management, Landscaping	6%
Retail Trade	6%
Manufacturing	5%
Accommodation or Food Services	2%
Other	2%

Source: California 2002 Economic Census Vehicle Inventory and Use Survey. U.S. Department of Commerce. U. S. Census Bureau

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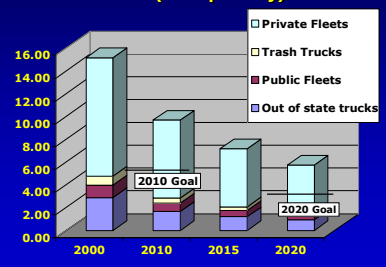
Heavy-Duty Diesel On-Road Fleets
Diesel PM Emissions
(tons per day)



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Heavy-Duty Diesel Private Fleets
Control Measure

- Reduce diesel PM from on-road (in-use) diesel-fueled private fleets.
- Diesel-powered vehicles with a gross vehicle weight rating (GVWR) of 14,000 lbs or greater.
- Includes but not limited to: private fleet heavy-duty trucks, private fleet buses, and motor homes
- Does not apply to heavy-duty vehicles covered by ARB's Solid Waste Collection, On-Road Heavy-Duty Municipality and Utility Owned Truck control measures and Fleet Rules for Transit Agencies.

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Rulemaking Process

- Work with public and affected stakeholders
  - First workshops to discuss general concepts
  - Informal workgroup meetings and additional workshops as appropriate
- Staff evaluation and public review
  - Fleet and emissions inventory
  - Control technology feasibility/availability
  - Economic costs and environmental benefits
  - Consider need for compliance flexibility
  - Propose concepts
- Formal public comment period before Board consideration
- Public hearing and consideration by Board

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On-Road Private Fleets Tentative Schedule

- First public workshop series
  - Sacramento, April 5; El Monte, April 12; and Fresno, April 13
- Workgroup meetings
  - Late spring/early summer 2006
- Second public workshop
  - Discuss regulatory concepts (late summer)
- Additional workgroup meetings (Fall)
- Third public workshop
  - Regulatory proposal in winter 2006/2007
- Formal Board consideration in mid 2007

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Contacts

- **Tony Brasil, P.E., Manager, In-Use Control Section**
  tbrasil@arb.ca.gov
  (916)323-2927
- **Jackie Johnson (staff)**
  jjohnson@arb.ca.gov
  (916)323-2750
- **Annette Hebert, Chief, Heavy-duty Diesel In-use Strategies Branch**
  ahebert@arb.ca.gov
  (626)575-6973
- **Ron Nunes (staff)**
  rnunes@arb.ca.gov
  (916)327-0376

Website: http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm

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